

**Lind Point Housing and Resource
Management and Science Facility**
Earth Change Plan /
Environmental Assessment Report

for

United States Virgin Islands
Department Of Planning And Natural Resources
Major Land Development Application

March 1, 2020

Prepared for:

National Park Service
Virgin Islands National Park

Prepared by:

Stantec Consulting Services Inc.

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1.0 NAME AND ADDRESS OF APPLICANT/PROFESSIONAL AFFILIATES

Applicant (see Appendix E - Agent Authorization Form)

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Owner / Developer

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Location: 18°20'12.2"N, 64°47'37.4"W
Estate: Caneel Bay
Property ID: 3-06003-0102-00
Owner: National Park Service, St. John, VI 802



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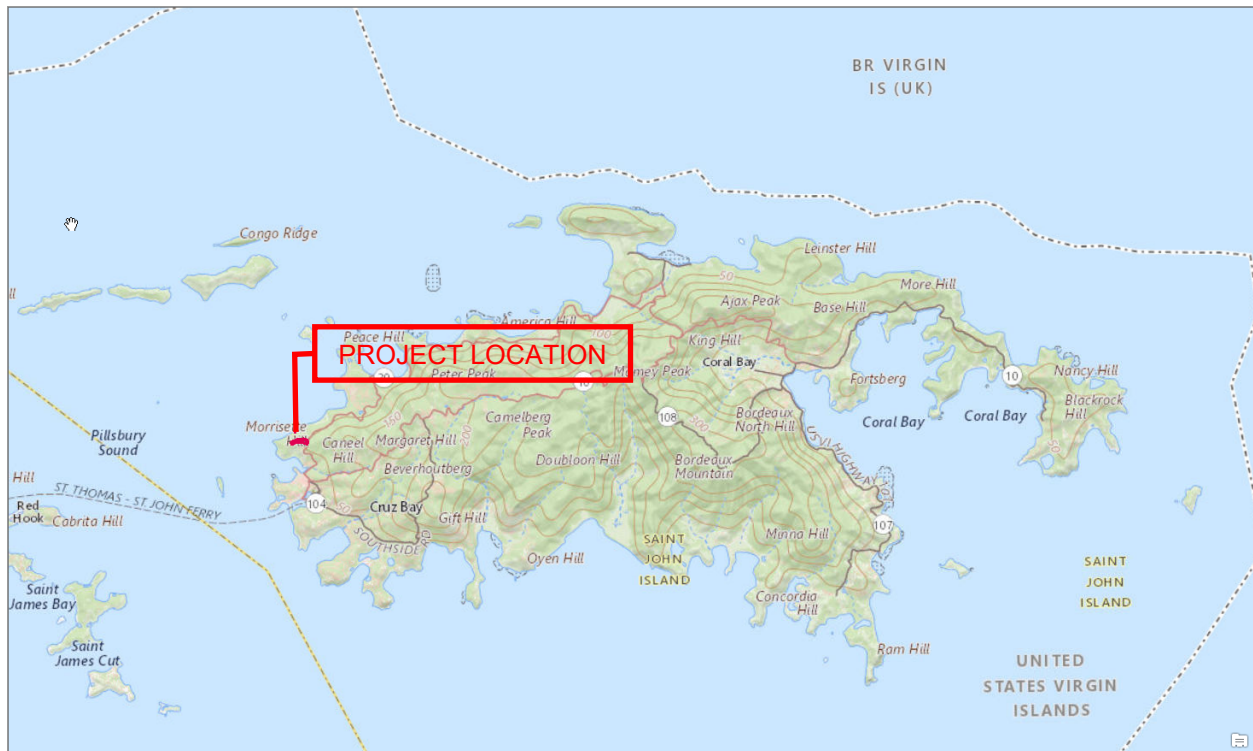


Figure 2 - St. John Location Map

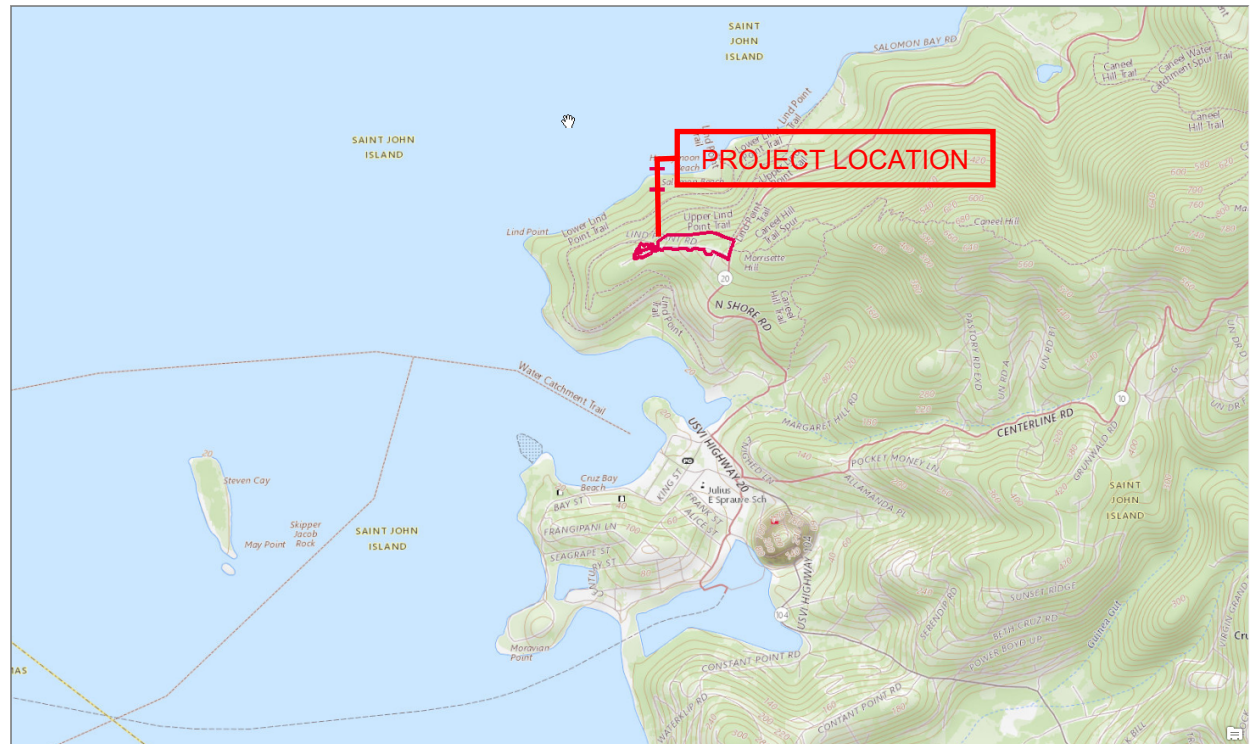


Figure 3 - Cruz Bay Vicinity Map

3.0 ABSTRACT

In September 2017, two Category 5 hurricanes devastated much of St. Thomas and St. John Islands, including the Virgin Islands National Park. The storms caused extensive damage to park facilities and resources including ~7,000 square feet of housing and ~6,000 square feet of administrative space. As a result, the park has lacked sufficient housing space, work, and office spaces for its employees. The current conditions of the park facilities have forced staff to relocate off the island, limiting their ability to manage the hurricane relief effort and park maintenance. The National Park Service is proposing to replace the housing and administrative spaces that were destroyed due to Hurricanes Irma and Maria.

The 2018 Environmental Assessment of Lind Point (See **Appendix A**) identified the 2.8 acre footprint for redevelopment in St. John off of Lind Point Road. This footprint is situated at an elevation between 160 and 250 feet above sea level. This project reflects the construction of approximately 6,000 square feet of housing on the north side of the Lind Point Road; as well as, approximately 9,000 square feet for a new Resource Management Administrative Facility (RMS) which includes offices, museum collections storage, park archives, laboratory, and a dive locker.

The 6,000 square feet of housing is divided into three structures: two (2) single family houses and one (1) group housing building.

The 9,000 square feet of resource management space will include the replacement of 3,000 square feet of the Bally building, archive storage, and the 1640's Danish Warehouse that was completely destroyed by the storms. The resource management facility includes the replacement of the 3,000 square feet of office space in the damaged Lind Point Biosphere.

Multiple locations between St. Thomas; Wintberg and Redhook and St. John's; Sea Plane Ramp, Maintenance Area, Lind Point and Ball Field were considered during the initial selection process. Ultimately, Lind Point was selected as the construction location in order to: meet park operational needs, minimize impacts to natural and cultural resources, and meet NPS accessibility, sustainability, and resiliency standards.

Proposed structural development was designed to be low profile and blend into the environment as much as possible, taking advantage of the natural topography. The structures are no more than one story in height, and no higher than any of the existing structures in the area. Color, exterior lighting, and interior light emitting from the property are dampened to lessen the impact on the natural environment.

4.0 OBJECTIVES OF THE PROPOSED PROJECT

The purpose of the 2018 Environmental Assessment of Lind Point was to establish a thoughtful and comprehensive vision for reconstruction of the park's destroyed infrastructure to help the park return to full operations. The plan was intended to help support the park's staffing, protect park resources, and provide for future efficiencies in management and operation of the park. The National Park Service met this purpose and vision by meeting the following objectives:

- a. address park operational needs and management realities
- b. ensure selected locations for reconstruction of replacement buildings minimize impacts to natural and cultural resources
- c. ensure selected locations for reconstruction of replacement buildings are considerate of employee safety and, in the case of housing, access to public services within walking distance
- d. ensure replacement facilities meet the park's needs in terms of use and space while still being mindful of cost and limiting the park's infrastructure footprint
- e. propose reconstruction that supports the current staffing makeup of the park while also being flexible enough to account for future changes in park staffing and operations, where possible
- f. propose reconstruction that is sensitive to the surrounding community, recognizes the stress on park neighbors following the storms, and limits further impact to their quality of life
- g. provide guidance that allows for smart investment in infrastructure to maximize the life cycle of new buildings
- h. select locations for replacement buildings that can meet current hurricane ratings and incorporate renewable energy/green technology, as possible
- i. select locations for replacement buildings that can meet all NPS accessibility, sustainability, and resiliency standards

As a result of hurricane damage, the Park has lacked sufficient housing space for its employees, and office/work space for its Resource Management Division. A plan was needed to evaluate opportunities for the placement of reconstructed facilities such that sustainability, resiliency against future storms, and efficiency in construction costs and in park operations can be achieved.

The objective of the proposed project is to support park staff so they can effectively and efficiently restore full park operations and services as soon as possible.

5.0 DESCRIPTION OF PROJECT

The 2018 Environmental Assessment of Lind Point (EA - See **Appendix A**) identified the initial footprint for redevelopment on the north side of Lind Point Road as a **2.8 acre** area. The footprint is situated at an elevation between 160 and 250 feet above sea level. This project proposes approximately **6,000 square feet of housing** on the north side of the Lind Point Road, as well as approximately **9,000 square feet for a new resource management administrative facility** which includes offices, museum collections storage, park archives, a lab, and a dive locker.

At the completion of design, the project proposes only **1.9 acres** of disturbance within the initial projected **2.8 acre footprint** evaluated in the EA. An additional **0.9 acres** of roadway maintenance is proposed along the existing Lind Point Road. Total project area is **2.8 acres**.

The 6,000 square feet of housing will be divided into three structures: 2-bedroom single family home, a 3-bedroom single family home, and a group residential home. Additional site development within the EA footprint includes parking, stormwater improvements, and sanitary sewer improvements.

5.1 SUMMARY OF PROPOSED ACTIVITY

5.1.1 Purpose of Project

In September 2017, two Category 5 hurricanes devastated much of St. Thomas and St. John Islands, including the Virgin Islands National Park. The storms caused extensive damage beyond repair to park facilities and resources including ~7,000 square feet of housing and ~6,000 square feet of administrative space. The purpose of the project is to replace the housing and administrative spaces that were destroyed due to Hurricanes Irma and Maria.

5.1.2 Presence and Location of Critical Areas

Several issues and impact topics were considered by the National Park Service, but ultimately were dismissed from further analysis in the EA (see **Appendix A - pages 6 through 10**). Full descriptions and details are provided in the EA, and a brief summary of the major topics dismissed are provided below.

Special Status Species

Per Page 8 of the EA (See **Appendix A**), No wildlife populations in the park would be appreciably affected by the construction and use of the new facilities.

Wildlife

Per Page 8 of the EA (See **Appendix A**), None of the above special status species occur in the Lind Point project area, or are of concern, this topic was dismissed from further consideration.

Archeology

Per Page 8 of the EA (See **Appendix A**), No cultural resources, including historic ruins or archeological remains, were identified during the pedestrian survey or subsurface testing; therefore, no cultural resource impacts are expected to result from actions in this plan.

Historic Structures

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Per VISHPO approval letter received November 12, 2019 (See **Appendix D**), given that this site is previously disturbed land and the likelihood for adverse effect to any significant cultural resources is extremely low or non-existent, the VISHPO has no objections to the proposed undertaking.

5.1.3 Method of Construction

Per the Geotechnical Report (see **Appendix B**), excavations through weathered rock, if necessary, may require the use of **hydraulic fracturing equipment**. A field seismic refraction test (ASTM D5777) is recommended in order to evaluate the proper equipment or method to be used to reach the desired excavation depth. Any existing abandoned underground utilities, substructures, foreign debris and/or other unsuitable material encountered during excavations shall be completely removed and replaced with new fill material. Any known active underground utilities within the footprint of new structures shall be relocated. Groundwater is not expected to be of concern during excavations and construction of foundations. However, if perched water is found, it should be managed by means of direct pumping. The excavations shall be maintained in a dry state. Runoff shall be diverted away from open excavations. Water stagnation shall be avoided as this may deteriorate the soil bearing capacity. The project contractor is responsible for providing safe excavation environment for working personnel in accordance to pertinent OSHA regulations at the time of construction.

Explosives are prohibited and shall not be used as a form of land clearing and earth change for this project.

5.1.4 Provisions to Limit Site Disturbance

The 2018 Environmental Assessment of Lind Point (EA - See **Appendix A**) identified the initial footprint for redevelopment on the north side of Lind Point Road as a **2.8 acre** area. At the completion of design, the project proposes only **1.9 acres** of disturbance within the initial projected **2.8 acre footprint** evaluated in the EA. An additional **0.9 acres** of roadway maintenance is proposed along the existing Lind Point Road. Total project area is **2.8 acres**.

Site limits of disturbance shall be clearly defined by silt fencing during construction (see **Sheet C2.2 – Erosion Control Plan**).

5.1.5 Erosion and Sediment Control Devices

As the existing site is cleared, grubbed and graded to the proposed contours shown on the construction site plans, erosion prevention BMPs shall be placed throughout the construction site to aid in the prevention of sediment-laden stormwater runoff. These BMPs shall be focused in areas with high potential of erosion, areas preceding infiltration practices, and shall be applied to all steep slopes. That is slopes equal to or greater than 3H:1V. See **Sheets C2.2 and C2.3 Erosion Control Plan** of the Construction Drawings for a 2 phase Erosion Control Plan.

Each erosion prevention measure shall be selected on a site-specific basis and details have been provided on the construction site plans. The construction plans (see **Sheets C2.4 to C2.5 Erosion Control Details**) identify all proposed Erosion Prevention BMPs and the recommended installation, maintenance, and inspection procedures.

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Examples of Erosion Prevention BMPs are, but are not limited to, **silt fencing, construction entrance, concrete washout, surface roughening, temporary seeding, erosion control blankets, turf reinforcement mats, riprap, outlet protection, and dust control**. Information on the design and proper use of Erosion Prevention BMPs can be located in the Virgin Islands Environmental Protection Handbook, 2002

Additional details of the proposed Erosion Control BMPS and identified in Section 3 Erosion and Sediment Control BMPs of the C-SWPPP (see **Appendix C – CSWPPP**).

5.1.6 Schedule for Earth Change and Implementation of Erosion and Sediment Control Measures

The construction activities at this site will be implemented in 2 Erosion Prevention and Sediment Control Phases. The first phase includes the initial installation of perimeter controls, sediment control BMPs, and the construction entrance. The second phase includes the bulk of the construction activities and the implementation of internal storm water management BMPs, such as inlet protection. Following construction, all areas disturbed will be seeded or landscaped to achieve final stabilization.

See **Sheets C2.2 and C2.3 Erosion Control Plan** of the Construction Drawings for a 2 phase Erosion Control Plan.

5.1.7 Maintenance of Erosion and Sediment Control Measures

The stormwater maintenance schedule for each BMP will comply with one or more of the following laws, regulations, or codes:

- Environmental Protection Program; Virgin Islands Code Title 12, Chapter 13
- USVI Coastal Zone Management Program, Section 6217
- Virgin Islands Environmental Protection Handbook, 2002

Damaged or non-functioning measures shall be replaced or repaired immediately in accordance with the guidelines set forth in the Virgin Islands Environmental Protection Handbook, 2002.

All BMPs and other protective measures identified in the SWPPP must be maintained in effective operating condition. If site inspections are not operating effectively, maintenance must be performed within seven (7) calendar days, before the next inspection, or as reasonably possible, and before the next storm event whenever practicable to maintain the continued effectiveness of Stormwater controls. If periodic inspection or other information indicates that a BMP has been used inappropriately, or incorrectly, the Permittee must address the necessary replacement or modification required to correct the BMP within a time frame of 48 hours of identification.

If existing BMPS need to be modified or if additional BMPs are necessary to comply with the requirements of this permit, implementation must be completed before the next storm event whenever practicable. Sediment from sediment basins must be removed as indicated in the SWPPP or when the design capacity has been reduced by 50%, whichever occurs first. Sediment collected by Silt Fence, or another

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sediment control measure, must be removed when the deposited sediment reaches 1/3 of the height of the above-ground portion of these BMPs, or before it reaches a lower height based on the manufacturer's specifications.

Refer to the construction site plans sheets for BMP maintenance notes, and drainage facility maintenance notes and schedules.

5.1.8 Stormwater Management

On-site runoff from proposed impervious surfaces will be directed to stormwater BMPs (including **cisterns, bioswales, and bioretention**) for water quality and quantity treatment. Runoff from roadway and parking areas will be captured with catch basins and directed to bioswales/ bioretention via underground pipes. Runoff is conveyed to the treatment area, which consists of a grass buffer strip, sand bed, ponding area, organic layer or mulch layer, planting soil, and plants. Runoff passes first over or through a sand bed, which slows the runoff's velocity, distributes it evenly along the length of the ponding area, which consists of a surface organic layer and/or ground cover and the underlying planting soil. Common particulates removed from stormwater include: Total Phosphorus, Metals, Total Kjeldahl Nitrogen (TKN), Total Suspended Solids, Organics, and Bacteria.

See **Sheets C5.1 to C5.8 for Drainage Plan and Details** of the Construction Drawings for the proposed stormwater management system including recommended installation and maintenance.

See **Section 6.3 Drainage and Erosion Control** below for additional details of the stormwater management system.

5.1.9 Maintenance of Stormwater Management

In general, all stormwater management systems will be checked after each significant rainfall. Inspections of the construction site shall be conducted at least once every seven (7) calendar days; and within 24 hours of the occurrence of a storm event of 0.25 inches or greater. Any necessary repairs or clean up to maintain the effectiveness shall be made immediately.

See **Sheets C5.1 to C5.8 for Drainage Plan and Details** of the Construction Drawings for the proposed stormwater management system including recommended installation and maintenance.

5.1.10 Method of Wastewater Collection and Disposal

A new sewer main is proposed to serve the three new housing buildings and RMS facility (See **Sheet C6.1 Sewer Plan**).

The proposed sewer main will tie into an existing underground sanitary sewer gravity pipe system that ties into an ex. sewer manhole (A2) located adjacent to an existing structure (Building 129).

There are 5 existing residential duplex structures on Lind Point Road. All existing structures on Lind Point Road are connected to an existing underground sanitary sewer gravity pipe system that ties into a sewer

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manhole (A1) located approximately 85 feet south of ex. sewer manhole A2. From here, an ex. sewer main flows south approximately 1800 linear feet via a series of underground 6" PVC and manholes. The sewer main ties into an existing pump station owned by the National Park Service. The gravity sewer main was designed and installed in the 1980s. Proposed wastewater design and unit flow rates were designed to meet guidelines set forth by US EPA Onsite Wastewater Treatment Systems Manual (February 2002).

The proposed gravity main and existing gravity main is capable of handling the peak wastewater flow from the proposed development.

5.1.11 Potable Water Supply

Potable water shall be sourced from individual cisterns that stores captured stormwater from the roof of each building. This method is typical for the region. Stormwater shall be captured via roof runoff and gutter system. Stormwater flows to the closed concrete cistern via exterior PVC pipe system. Each building has its own cistern and pump room underneath the building. The pump room shall contain a filtration system comprised of a series of filter cartridges including a 20 micron, 5 micron, and 1 micron filters. Thereafter, chlorine is also injected to the water as a final treatment.

5.1.12 Vegetation

Much of Virgin Islands National Park's native vegetation has been altered or lost due to past human activities. See the L series sheets for the Landscape Plan. A National Park Service vegetation ecologist and a local St. John horticulturalist have been consulted to develop an appropriate native plant list for the project which will also include culturally significant plants. The intent is that the plant material will be grown for the NPS during the building construction period for use once buildings are complete. Native and adaptive species have been selected in order to ensure that plants will be suited to the site and prevent further introduction of invasive species.

Forest scrub is predominant from the road edge north to the limits of the site. A limited number of trees greater than 6" diameter exist on site. No known protected or endangered species exist within the project area.

Thicket scrub and semi-deciduous woodland make up the majority of the site. The EA notes: "The project area is in a historically heavily disturbed area once cleared for grazing. Based on park staff observation, it is dominated by nonnative invasive species, particularly tan tan (*Leucaena leucocephala*) and guinea grass (*Megathyrsus maximus*). Other nonnative species growing here include such species as genip (*Melicoccus bijugatus*), headache tree (*Morinda citrifolia*), ping wing (*Bromelia penguini*), and sweet lime (*Triphasia trifolia*). Native plant species typical of the Lind Point area include black mampoo (*Guapira fragrans*), mampoo (*Pisonia subcordata*), silver palm (*Coccothrinax barbadensis*), guavaberry (*Myrciaria foribunda*), frangipani (*Plumeria alba*), portia tree (*Thespesia poulnea*), cachibou (*Bursera simaruba*), love bush (*Cuscuta Americana*), night blooming cereus (*Selenicereus grandiflorus*), rat bean (*Capparis baducca*), French grass (*Commelina erecta*), and chink (*Bourreria succulenta*). Native plants are in limited abundance, with invasive being dominant. Few mature native trees grow in the project area.

5.2 SITE PLANS

See Construction Drawings included with this submittal. Sheet G.02 contains a highlighted sheet index of all drawings included with this submittal. Construction Drawings include full Civil and Landscape Architecture sheets.

Select Architectural sheets are included to show Floor Plans, Total Project Elevation Views, and Section Views of each building. Select Structural drawings were included to show Foundations/Footings of each proposed building.

Additional sheets of the Construction Drawings are available upon request.



Figure 4 – Quad Map

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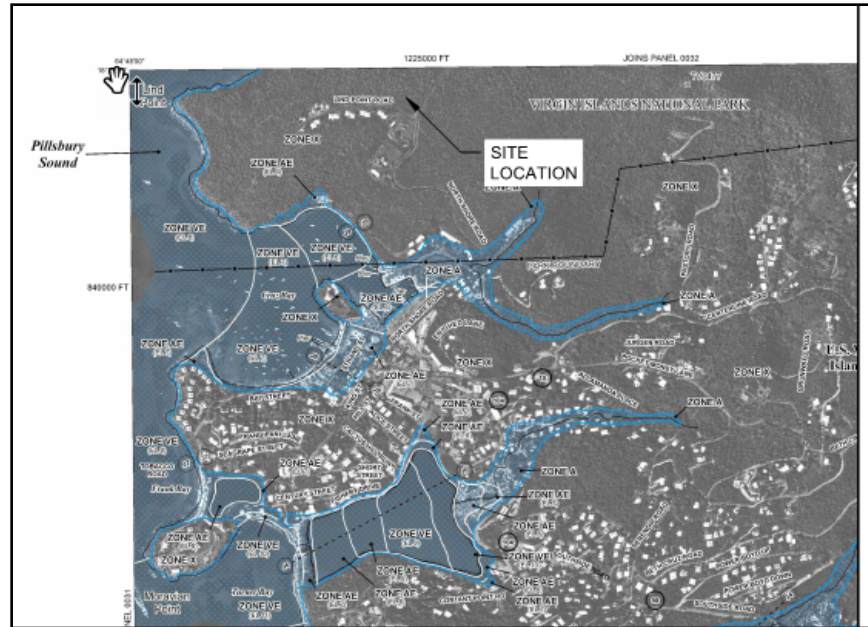


Figure 5 – FEMA Map

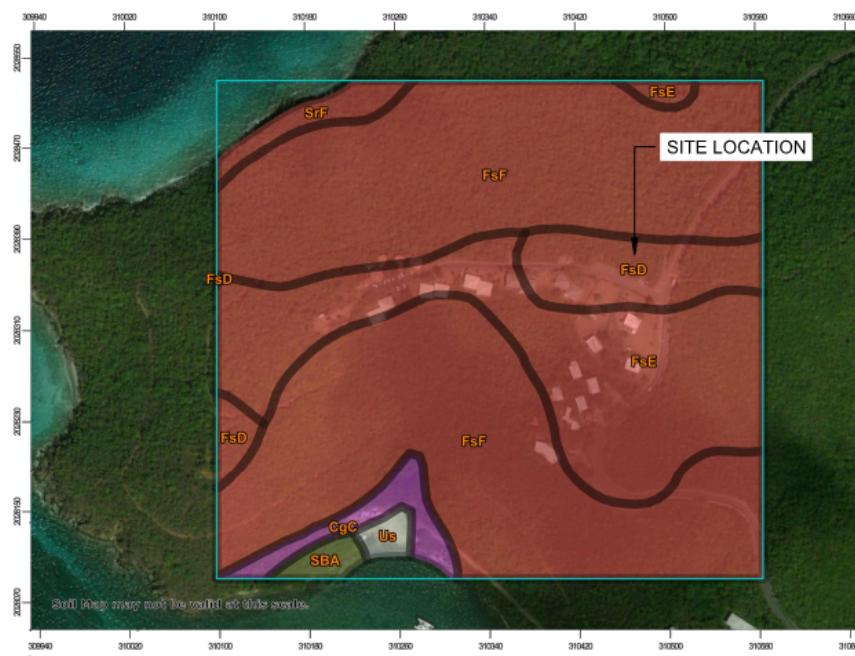


Figure 6 – Soil Survey Map

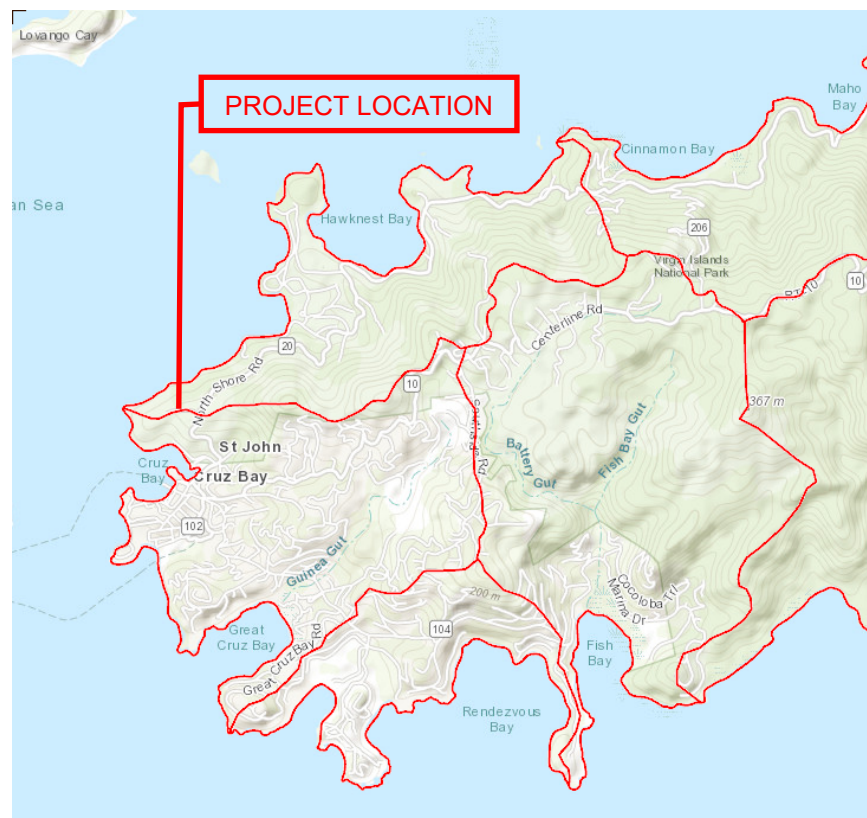


Figure 7 – Water Resources (Drainage) Map

5.3 PROJECT WORK PLAN

The project work plan and schedule will commence upon issuance of the required approvals. Project design will be completed while these applications are being processed and it is anticipated that the construction contract will be awarded upon receipt of the necessary approvals. Construction will commence as soon as possible after award of the contract. The construction is anticipated to require a total of 18 to 24 months, depending on weather conditions. Below is a tentative schedule of the project:

Activity	Start Date (mo/yr)	End Date (mo/yr)
Award Contract	11/2020	12/2020
Staging/Mobilization	1/2021	1/2021
Erosion Control Phase 1	1/2021	1/2021
Demolition and Site Clearing	2/2021	3/2021
Sanitary Sewer Improvements	4/2021	5/2021
Stormwater Improvements	5/2021	7/2021
Erosion Control Phase 2	6/2021	1/2023
RMS Building and Residential Building Construction	6/2021	7/2022
Roadway Improvements	7/2022	11/2022
Final Stabilization and Landscaping	12/2022	1/2023

6.0 SETTING AND PROJECT IMPACT ON THE NATURAL ENVIRONMENT

6.1 CLIMATE AND WEATHER

Rainfall

The average annual rainfall on St. John is approximately 45 inches, ranging from 35 inches toward the eastern end of the island to more than 55 inches at the higher elevation to the west. Rainfall usually occurs in brief, intense showers of less than a few tenths of an inch and major rainfall events are associated with weather systems. The Virgin Islands have no sharply defined wet season. The wettest period generally is from September to November and the driest period is from January to June. The closest weather station operated by the Southeast Regional Climate Center is the East End Station (672551). Data from January 1, 1972 and April 30, 2012 are found in the following tables.

Table 1 - Summary of Precipitation Data – East End, USVI (672551)

Average Total Precipitation (in.)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
	2.34	1.66	1.44	2.94	3.52	2.26	2.91	3.72	5.00	4.86	5.89	3.23	39.78

Source: <http://www.sercc.com/cgi-bin/sercc/cliMAIN.pl?vi2551>

Proposed stormwater design is based on statistical rainfall depths that were obtained from Figures 6.6 to Figure 6.11 of the Virgin Islands Environmental Protection Handbook (2002) which is based on Cruz Bay data from the USDA SCS and US Weather Bureau. The rainfall depths for a 24-hour duration corresponding to the 2-year, 10-year, 25-year, 50-year, 100-year events are as follows: 3.9 inches, 6.6 inches, 8.0 inches, 9.2 inches, and 10.5 inches respectively.

See **Section 6.3 Drainage and Erosion Control** for additional details on stormwater design.

Hurricanes

The Island of St John is threatened by a variety of hazards, including earthquakes, hurricanes, and other severe weather events. Additional hazards such as extreme heat, drought, and wildfire are also present. The remote and isolated nature of the small island compounds potential impacts of these hazards due to limited resources and limited response capacity within the local community. Most resources and people arrive to the island by boat. Hazard events that disrupt these daily transportation operations threaten a variety of industries and resources for daily living. Local infrastructure also proved to be extremely vulnerable in recent storms, leaving residents without power for several weeks. Most homes depend on rainwater capture for domestic use. At the time of the design team's site visit, the island was experiencing an unseasonably long drought, further illustrating potential vulnerabilities complicated by limited infrastructure.

Hurricanes represent the greatest threat to the island as illustrated by the widespread impact of back to back major storms in 2017 and other significant weather events in previous decades. Hurricanes have the potential to impact a community in multiple ways. Hurricanes often cause storm surge, leading to flooding

and destruction of structures and vegetation in exposed areas along the coast. Massive rainfall can overwhelm storm sewer systems and cause flooding, particularly in low lying areas. Flash foods can lead to erosion and trigger secondary hazards including land or mudslides. The greatest hazard impact of the 2017 hurricanes was wind. Wind events have the potential to multiply impacts of other hazards creating further damage to the built and natural environment. Wind storms may compromise the structural integrity of the building, allowing water to penetrate the envelope, or may cause partial or total collapse. Hurricane force winds will turn storm debris into projectiles that can cause further damage to buildings. Damage to the building envelope may allow water infiltration, creating the potential for mold growth. Flood waters entering homes may inundate electrical systems, creating fire hazards.

See **Section 7.11 Hurricane Preparedness** on the resiliency strategies incorporated to the architectural and structural design.

6.2 LANDFORM GEOLOGY, SOILS AND HISTORIC LANDUSE

According to the U.S. Geological Survey (USGS) geologic map of the St. Thomas and St. John islands, the explored area falls within a geologic zone that corresponds to Lousenhoj Formation (KI). Figure below shows a portion of the geologic map and the approximate site location. The mentioned geology is described as a volcanoclastic rock formation.

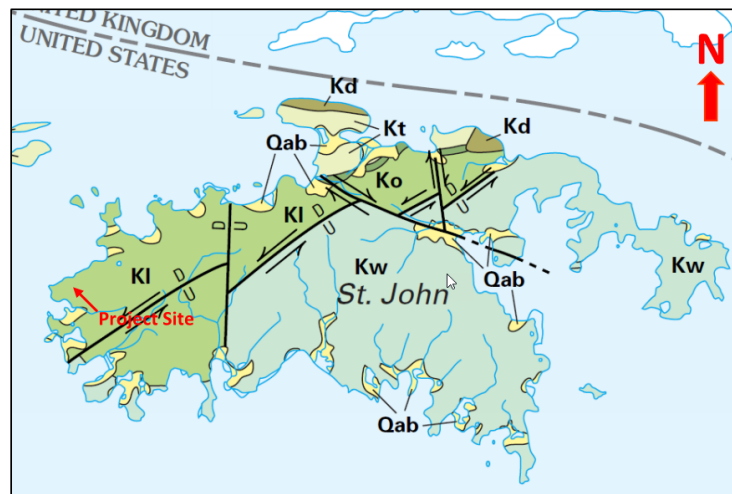


Figure 8 - Project site location in USGS geologic map

The stratigraphy is characterized by a weathered horizon of the above-mentioned Lousenhoj Formation consisting of a shallow weathered rock and occurring upper residual soils. Each stratum is described as follows:

Stratum No. 1 – Residual Soils

The upper residual soils were found in borings no. 1, 4, 7, and 8, having a 2 to 4 feet layer thickness.

Residual soils are composed of sandy silt with some weathered rock fragments. SPT-N values recorded

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are varying from 15 to 36 blows per foot (bpf) of penetration. Moisture contents measured are from 10 to 15%.

Stratum No. 2 – Weathered Rock

The lower stratum encountered was comprised of weathered rock sampled as rock fragments with sandy silt. Weathered rock occurs from surface to 4 feet depth and extends to the end of boreholes at 3.5 to 10.5 feet depth BEGS. SPT-N values registered are ranging from 40 to above 100 (i.e. refusal blow counts) bpf. Moisture contents obtained are from 1 to 18 %.

Groundwater Level

There was no evidence of the presence of groundwater level within the depths drilled. However, perched water might be found trapped within the upper residual soils. The groundwater data is based on observations made at the time of our fieldwork. The above information corresponds to a general interpretation of the subsoil conditions of the explored area. For more detailed description regarding the soil profile, refer to **Appendix B – Geotechnical Report**.

Historic Landuse

Per Page 7 of the EA (see **Appendix A**), the proposed project would alter no more than 2.8 acres of topsoil and near-surface soil substrates. However, much of the on-site soil has already been altered by past activities associated with ranching and terracing, and no known unique or special soils would be expected to be lost due to the proposed construction activities. With the application of topsoil salvage and reuse, and other mitigation measures for soil erosion control, the proposed development should have a negligible effect on soils.

6.3 DRAINAGE AND EROSION CONTROL

Section 6.3 heavily references the Comprehensive Stormwater Pollution Prevention Plan (C-SWPPP) in **Appendix C**. A C-SWPPP is a site-specific, written document that identifies all of the activities and conditions at their site that could cause water pollution, and details the steps the project will take to prevent the discharge of any unpermitted pollution. The following sections summarizes the stormwater and erosion control design. For detailed information see the referenced sections of the C-SWPPP.

6.3.1 Pre-Development Conditions

The project site is characterized by steeply sloping topography with significant elevation change (160 to 250 feet) from east to west across the site.

The pre-development drainage area is generally conveyed to two main discharge locations located on each side of Lind Point Road. Lind Point Road is a natural ridge line separating a north drainage area and a south drainage area. Neither the north side or south side has a channelized gut upstream or downstream of the project area.

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On the north side, existing topography shows a ridgeline that separates sheet flow into 2 separate directions: north toward Salomon Bay, and to the north west toward an unnamed beach. On the south side, there is existing asphalt sheetflow from Lind Point Road which flows south toward Cruz Bay.

See **Appendix C – CSWPPP - Section 2 – Stormwater Design And Results** for thorough details on Pre-development conditions for this project including descriptions on Pre-Development Drainage Maps, Topography, Soils, Landuse, Sub-watershed Delineation, Rainfall, Curve Number Information, Time of Concentration Methodology, and Pre-Development Peak Discharges.

6.3.2 Post-Development Conditions

The proposed project consists of the construction of 4 structures, parking, utility, and roadway improvements. Structures include a resource management administrative facility for NPS employees and three residential structures including a 2-bedroom single family home, a 3-bedroom single family home, and a group residential home.

On-site runoff from proposed impervious surfaces will be directed to stormwater BMPs (including **cisterns, bioswales, and bioretention**) for water quality and quantity treatment. Stormwater runoff from the roofs of all buildings will be directed to their individual cisterns located underneath the structures. Runoff from roadway and parking areas will be captured with catch basins and directed to bioswales /bioretention via underground pipe. See below section for Stormwater Management.

Soil disturbing activities include: clearing and grubbing; installation of erosion and sediment controls; grading; utilities; stormwater/drainage; construction of parking, roadway improvements, and preparation for final stabilization and seeding.

The post-development condition will generally maintain the existing drainage patterns of the pre-development condition. The post-development hydrology maintains the three major drainage basins as shown in the pre-development drainage map. Each major drainage basin discharges to the same analysis point as designated in the pre-development drainage map and will serve as the reference points for comparing pre- and post-development H&H results for the project area.

Per the Virgin Islands Development Major Land Permit Application, Page 6, Post-development peak runoff rates shall be equal to or less than pre-development rates up to the 25-year, 24 hour storm event. The pre- vs. post-development results show a total decrease in runoff rates for the 10-year to 100-year storm events. There is an increase of 0.11 cfs for the 2-year event. The increase in runoff rates have negligible effect on the peak water surface elevations at Lind Point Road.

See **Appendix C – CSWPPP - Section 2 – Stormwater Design And Results** for thorough details on Post-development conditions including Post-Development Drainage Maps, Topography, Soils, Landuse, Sub-watershed Delineation, Rainfall, Curve Number Information, Time of Concentration Methodology, Post-Development Peak Discharges, Pre- vs Post-Development Peak Discharges, Cisterns, Bioretention and Bioswale design.

6.3.3 Stormwater Management and Maintenance

On-site runoff from proposed impervious surfaces will be directed to stormwater BMPs (including **cisterns, bioswales, and bioretention**) for water quality and quantity treatment. Stormwater runoff from the roofs of all buildings will be directed to their individual cisterns located underneath the structures. Runoff from roadway and parking areas will be captured with catch basins and directed to bioswales /bioretention via underground pipe.

See **Sheets C5.1 to C5.8 for Drainage Plan and Details** of the Construction Drawings for the proposed stormwater management system including recommended installation and maintenance.

Cisterns

Each structure contains its own cistern system. Runoff will be diverted to the cisterns for filtration and used by occupants of each building. The building code of the USVI, reenacted in 1964 and revised in 1996, sets a mandatory cistern construction. The USVI building code specifies cistern capacity for dwellings of not less than 10 gallon for every square foot of roof area for one story buildings and 15 gallons per square foot for buildings of two or more stories. For all other buildings, a minimum 4.5 gallons for each square foot area is required. Each building meets and exceeds the USVI building code requirements except the RMS building which is 0.1 gallons off the requirement. Maintenance of the cistern is typically re-coated once every 5 years.

Bioswales/Bioretention

The design of the bioretention systems were based on the EPA Storm Water Technology Fact Sheet Bioretention dated September 1999. Both the Bioretention and Bioswales utilize the same design criteria including filtration media. Bioretention utilizes soils and both woody and herbaceous plants to remove pollutants from storm water runoff. Runoff is conveyed to the treatment area, which consists of a grass buffer strip, sand bed, ponding area, organic layer or mulch layer, planting soil, and plants. Runoff passes first over or through a sand bed, which slows the runoff's velocity, distributes it evenly along the length of the ponding area, which consists of a surface organic layer and/or ground cover and the underlying planting soil. Common particulates removed from storm water include: **Total Phosphorus, Metals, TKN, Total Suspended Solids, Organics, and Bacteria.**

Stormwater Pipe/Structure Design

Per the Virgin Island Development Code: Pre-Adoption Draft (06/07/14), design capacity of proposed storm infrastructure shall be the **10-year storm**. A hydraulic analysis was performed to design and size the stormwater pipe system. Each proposed pipe meets capacity requirements of the 10-year storm.

See **Appendix C – CSWPPP - Section 2 – Stormwater Design And Results** for thorough details on Post-development conditions for this project including descriptions on Post-Development Drainage Maps, Topography, Soils, Landuse, Sub-watershed Delineation, Rainfall, Curve Number Information, Time of Concentration Methodology, and Post-Development Peak Discharges, Pre- vs Post-Development Peak Discharges, Cisterns, Bioretention and Bioswale design.

6.3.4 Erosion Control and Maintenance

As the existing site is cleared, grubbed and graded to the proposed contours shown on the construction site plans, erosion prevention BMPs shall be placed throughout the construction site to aid in the prevention of sediment-laden stormwater runoff. These BMPs shall be focused in areas with high potential of erosion, areas preceding infiltration practices, and shall be applied to all steep slopes. That is slopes equal to or greater than 3H:1V. See **Sheets C2.2 and C2.3 Erosion Control Plan** of the Construction Drawings for a 2 phase Erosion Control Plan.

Each erosion prevention measure shall be selected on a site-specific basis and details have been provided on the construction site plans. The construction plans (see **Sheets C2.4 to C2.5 Erosion Control Details**) identify all proposed Erosion Prevention BMPs and the recommended installation, maintenance, and inspection procedures.

Examples of Erosion Prevention BMPs are, but are not limited to, **silt fencing, construction entrance, concrete washout, surface roughening, temporary seeding, erosion control blankets, turf reinforcement mats, riprap, outlet protection, and dust control**. Information on the design and proper use of Erosion Prevention BMPs can be located in the Virgin Islands Environmental Protection Handbook, 2002

Additional details of the proposed Erosion Control BMPs and identified in Section 3 Erosion and Sediment Control BMPs of the C-SWPPP (see **Appendix C – CSWPPP**).

6.4 FRESH WATER RESOURCES

The project area is located on a drainage high point with steeply sloping topography between elevations 160 to 250 feet. There are no freshwater resources within the site or downstream/upstream of the site. The closest beach, Salomon Beach, is located approximately 650 feet to the north. Furthermore, neither the north side or south side has a channelized gut upstream or downstream of the project area.

The project site is also located in Zone X as shown on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for US Virgin Islands, Map Number 7800000047G, dated April 16, 2007.

6.5 WETLANDS

The term “wetlands” refers to those areas that are inundated or saturated by ground or surface water at a frequency and duration to support a community of organisms specifically adapted to this type of environment.

This definition includes terrestrial wetlands as well as those shallow and intertidal marine areas supporting seagrasses or attached marine algae (including, but not limited to, salt or freshwater ponds, salt marshes, lagoons, tidal flats, etc.). Similar to Fresh Water Resources, there are no wetlands within the site or downstream/upstream of the site.

6.6 RARE AND ENDANGERED SPECIES

According to The U.S. Fish and Wildlife Service's Information for Planning and Conservation (IPaC) system, there are six federally listed threatened and endangered species that can be found within the Lind Point project area. **They were all considered and dismissed as not being present and/or not of concern for this project.** However here are the species that were identified, if issues do arise:

Roseate tern (*Sterna dougallii dougallii*). Threatened. A nesting colonial bird that occurs on small, steep, rugged islands/cays. Not present on Lind Point.

Hawksbill sea turtle (*Eretmochelys imbricate*). Endangered. The project area is at an elevation of 160 to 250 feet and is over 800 feet away from the nearest beach, which is separated by a hillside and dense vegetation. It is not habitat for this species, and nesting sand beaches would not be affected by the project.

Leatherback sea turtle (*Dermochelys coriacea*). Endangered. The project area is at an elevation of 160 to 250 feet and is over 800 feet away from the nearest beach, which is separated by a hillside and dense vegetation. It is not habitat for this species, and nesting sand beaches would not be affected by the project.

Virgin Islands tree boa (*Epicrates monensis granti*). Endangered. The tree boa has not been identified on St. John. There is no reason to expect it occurs in the Lind Point area.

Thomas' lidflower (*Calypttranthes thomasiana*). Endangered. This evergreen shrub or small tree is known to occur on only one site on St. John. It occurs in moist forest between 984 and 1,312 feet in elevation (<http://www.iucnredlist.org/details/%2043895/0>). This habitat is not present in the project area—it is on the other side of the island, several miles away.

St. Thomas prickly-ash (*Zanthoxylum thomasianum*). Endangered. This thorny plant grows as a shrub or small tree. It occurs in dry scrub thickets and woodlands at elevations ranging from 95 to 1,017 feet, on slopes facing predominantly south to east or along ravines. There are five known populations on St. John as of 2005 (USFWS 2015). The prickly-ash is not known to grow in the vicinity of the project area (T. Kelly, Virgin Islands NP, pers. com., 3-12-18).

A plant candidate species for federal listing occurs in the Lind Point area. Marron bacora (*Solanum conocarpum*) is a dry-forest shrub. It is known to occur in eight localities on dry, poor soils on St. John and ranges in number from 1 to 144 individuals. The plant is found in lower elevation coastal scrub forest, but can also occur around ridgelines as an understory component in diverse woodland communities. It is not known to naturally grow in the Lind Point area. However, four individual plants were planted by NPS employees in the area (T. Kelly, Virgin Islands NP, pers. com., 2-28-18). These cultivated plants have been heavily pruned.

The Endangered Species Act requires (section 7(a)(2)) that each federal agency, in consultation with the Secretary of the Interior, ensure that any action the agency authorizes, funds, or carries out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. The National Park Service consulted with the local U.S. Fish and Wildlife Service office on the presence and absence of listed species in the project area and suggested mitigation

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measures. Correspondence was sent on April 17, 2019, requesting comments from USFW about the possible effects on the *Solanum* plants. Their comments were provided as technical assistance under the Endangered Species Act (ESA)(87 Stat. 884, as amended; 16 United States Code 1531 et seq.) and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.).

Per email approval dated 4/26/2019 from the local U.S. Fish and Wildlife Service office, they reviewed and agreed that the proposed project will not result in adverse impacts to the *S. conocarpum* individuals. conservation measures such as flagging and avoidance of the plants were incorporate to the proposed project to avoid impacts to the *Solanum* individuals during construction and demolition activities. However, if it became apparent that the plants would be affected by demolition of the resource management offices and/or construction of the new facilities, the plants could be removed and transplanted to another appropriate location.

Three bat species are listed by the Territory of Virgin Islands as endangered, all of which occur on St. John: red fig-eating bat (*Stenoderma rufum*), Antillean fruit-eating bat (*Brachyphylla cavernarum*) and greater bulldog bat (*Noctilio leporinus*). These nocturnal bats likely forage in the Lind Point area, although they have not been documented as occurring in the project area. It is also unlikely that they roost in the area, given the scrubby- shrubby nature of the vegetation and the presence of people in the area — the trees and shrubs that would be removed for construction of the structures would be unlikely to provide roosts for the bat species. Noise from construction is not likely to affect the bats' foraging behavior since these activities would not occur during hours that bats are active.

Finally, approximately 20 other rare plant species are also listed by the Territory of Virgin Islands as occurring on St. John. However, none of these species occur in habitat like that found on Lind Point (T. Kelly, Virgin Islands NP, pers. com., 3-12-18). Because none of the above special status species occur in the Lind Point project area, or are of concern, this topic was dismissed from further consideration.

6.7 AIR QUALITY

The entirety of St. John is designated Class II by the Environmental Protection Agency in compliance with National Ambient Air Quality Standards. According to the EPA, in Class II air quality regions, the following air pollutants are regulated: open burning, visible air contaminants, particulate matter emissions, volatile petroleum products, sulfur compounds, and internal combustion engine exhaust (Virgin Islands Code Rules and Regulations). During the duration of the project at Lind Point, the use of heavy equipment and related facilities will have a short-term and minimal air quality impact. Once construction is complete there should not be any air quality impacts or concerns.

7.0 PROJECT IMPACT ON THE HUMAN ENVIRONMENT

7.1 LAND AND WATER USE PLANS

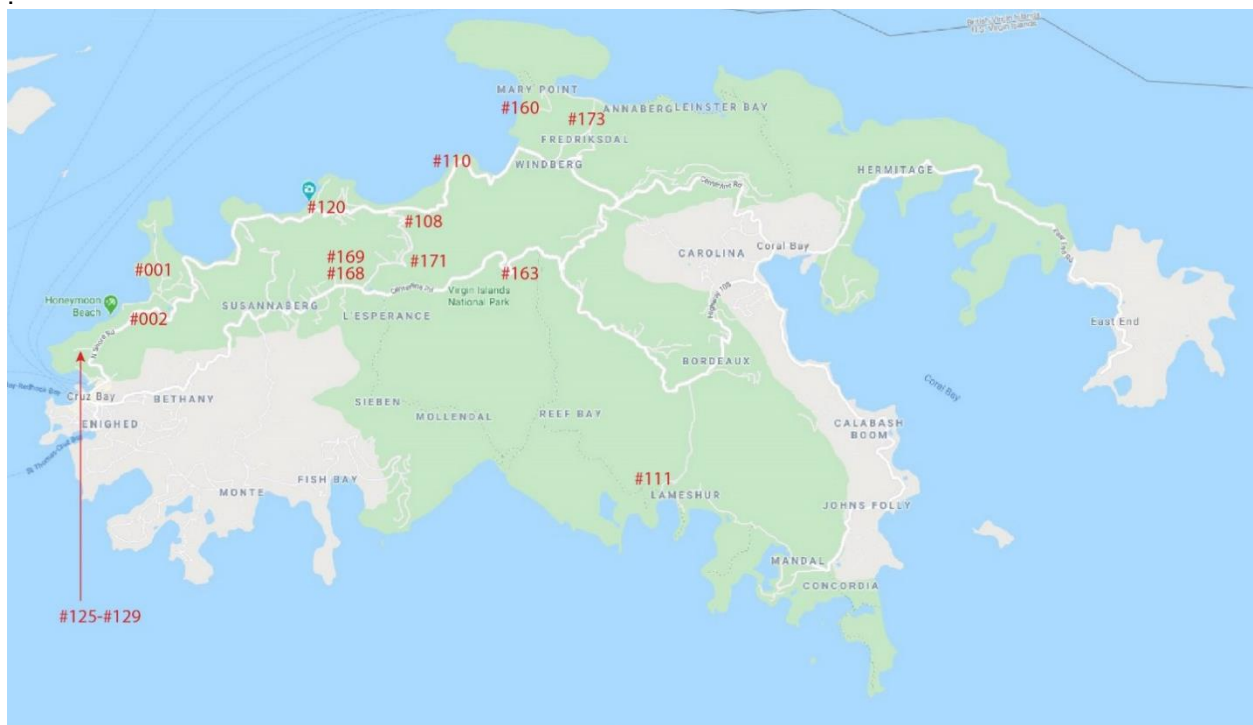
The project site is zoned Public (P) which complies with the Coastal Land and Water Use plan per the latest document published (2004).

Impacts on the existing site – The proposed site does not have any existing structures, and with this project we are developing the majority of the north side of Lind Point Road. Adjacent uses of this site include other developed land that includes housing on the south side of Lind Point Road. There is no additional development planned for this or adjacent sites. Only adjacent property not under National Park Service is a single family residence owned by Caneel Property.

7.2 VISUAL IMPACTS

Lind Point contains 5 existing duplex buildings running the length of the road east-west, an office cluster of 4 buildings (biosphere) and a storage building on the north side of the road at the western most point. The biosphere buildings were damaged and deemed structurally unsound by the hurricanes in 2017 and will be removed prior to this project. The storage building demolition is included in this project scope.

The proposed project is rebuilding the office type on the north side and adding 3 additional housing structures that are replacing the following homes: Montequ (#163), Callahan (#168), Lyne House Apartment (#002), Trunk Bay (#120), Lily Maho (#160), and Island Fancy (#173), and Lameshur (#111), which were also destroyed in hurricanes Irma and Maria.



Existing Housing Locations

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Maintenance of scenic views of natural landscapes of green mountains and tropical vegetation from the beaches and from the water will likely be impacted by this development. The design team is intending on mitigating the impact using a variety of effects with landscaping, natural colors pulled from the island, and building orientation to align with the slope of the site.

- Design team is minimizing the height of the walls and floors, utilizing the natural slope of the site to orient the buildings and allow for a single height space on the entry side.
- Design team is utilizing a low slope roof to assist in minimizing the vertical construction required to shed water. These roofs will either be behind parapets or sloped away from the beach & bay to minimize its visual appearance.
- Design team is investigating natural color schemes to help blend in with the vegetation.

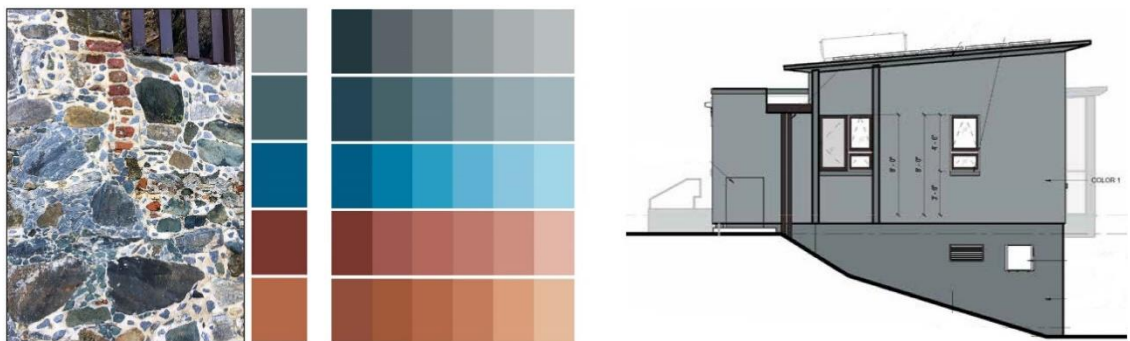


Figure 9 – Color Investigation and Elevation Studies

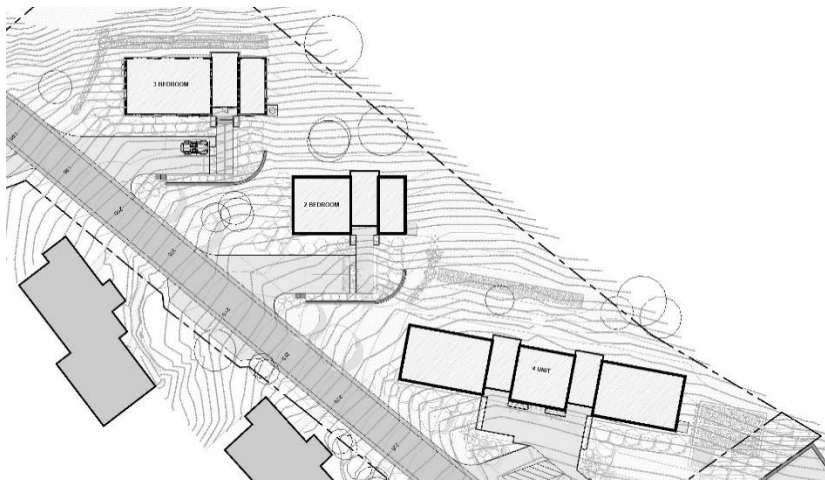


Figure 10 – Housing Contour Alignment

7.2.1 Viewsheds and Dark Night Skies

New structural development would be designed to be low profile and blend into the environment as much as possible, taking advantage of the natural topography. The structures would be designed to be no higher than any of the existing structures in the area

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In compliance with Dark Sky Guidelines, use of outdoor lighting on proposed projects occurs only where it is strictly needed and is designed for a specific task or function within a specific area. Minimal lighting is provided along egress paths and walkways for security and life safety. There is no architectural or landscape accent lighting proposed.

At the RMS facility, exterior lights will be controlled by an astronomical timeclock to ensure that lights turn off in non-working hours. All exterior fixtures at the housing and RMS will be full cutoff, LED fixtures with a color temperature (CCT) of less than 3000 Kelvins. Interior fixtures at the RMS facility are controlled by occupancy sensors to ensure that lights are not on when unoccupied. All interior light fixtures are located towards the center of the room or space to minimize or eliminate illumination directed towards exterior openings and further reduce potential for light trespass.

With respect to the Housing, the only north facing lighting will be the lower level storage area exterior light, which will be controlled via a timer switch, to allow for auto off without using an exterior occupancy sensor. The housing open air porches will have limited lighting consisting of a ceiling fan light kit and can lights over the doors. This lighting will be shielded from direct northern exposure via the housing structure itself.

7.3 IMPACTS ON PUBLIC SERVICES AND UTILITIES

7.3.1 Water

Potable water shall be sourced from individual cisterns that stores captured stormwater from the roof's of each building. This method is typical for the region. Stormwater shall be captured via roof runoff and gutter system. Stormwater flows to the closed concrete cistern via exterior PVC pipe system. Each building has its own cistern and pump room underneath the building. The pump room shall contain a filtration system comprised of a series of filter cartridges including a 20 micron, 5 micron, and 1 micron filters. Thereafter, chlorine is also injected to the water as a final treatment.

7.3.2 Sewage Treatment and Disposal

A new sewer main is proposed to serve the new buildings (See **Sheet C6.1 Sewer Plan**). The proposed sewer main will tie into an existing underground sanitary sewer gravity pipe system that ties into an existing pump station owned by the National Park Service. The gravity sewer main was designed and installed in the 1980s. Proposed wastewater design and unit flow rates were designed to meet guidelines set forth by US EPA Onsite Wastewater Treatment Systems Manual (February 2002). The proposed gravity main and existing gravity main is capable of handling the peak wastewater flow from the proposed development.

7.3.3 Solid Waste Disposal

The Virgin Islands Waste Management Authority (VIWMA) has specific guidelines and criteria for accepting construction debris. Construction debris shall be properly hauled and disposed at the Susannaberg Transfer Station to which it is then compacted and barged to St. Thomas where it is transported to the Bovoni Landfill on the southeastern end of St. Thomas for disposal.

7.3.4 Roads, Traffic, and Parking

Lind Point Road is a National Park owned dead-end road with a speed limit of 10 m.p.h. In order to maintain a separation of administrative and residential spaces, the Resource Management facility is proposed at the east end of Lind Point Road, so that visitors and employees may access the facility without traversing residential space. A turn-around is provided for unauthorized vehicles to turn around before entering the residential portion of the road which includes the existing NPS duplexes and proposed NPS housing.

Parking is provided in front of the RMS building for staff and visitors. Additional parking is provided on the east end of the site for visitor's who will access the Lind Point trail. During construction six temporary parking spaces will be provided for trail access. The new residential homes will have parking associated with each building. Additional paved parking will be added or improved on the south side of Lind Point Road to provide parking for residents of the existing duplexes.

7.3.5 Electricity

The RMS building will have an estimated peak electricity demand of 336 AMPS on a 208V, 3hp service. This demand will be supplied by a AC coupled Photovoltaic system during the day which during ideal conditions will supply 100% of the electrical demand. Under less than ideal sun conditions the local electrical utility VIWAPA will be used. The facility will also include an emergency diesel generator for extended outages of utility power during server weather events.

The 2 and 3-bedroom houses will have an estimated peak electricity demand of 70 AMPS on a 240V, 1ph service. This demand will be supplied by a DC coupled Photovoltaic system and 12 hours of battery storage and during ideal conditions will supply 100% of the electrical demand. Under less than ideal sun conditions the local electrical utility VIWAPA will be used. The facility will also include an emergency diesel generator for extended outages of utility power during server weather events.

The group house will have an estimated peak electricity demand of 125 AMPS on a 240V, 1ph service. This demand will be supplied by a DC coupled Photovoltaic system and 12 hours of battery storage and during ideal conditions will supply 100% of the electrical demand. Under less than ideal sun conditions the local electrical utility VIWAPA will be used. The facility will also include an emergency diesel generator for extended outages of utility power during server weather events.

The proposed housing on the site is relocating previously destroyed housing that was already in use on St John. The design is not increasing the amount of area or number of beds which would impact the long or short term use of the schools.

7.3.6 Schools

The proposed housing on the site is relocating previously destroyed housing that was already in use on St John. The design is not increasing the amount of area or number of beds which would impact the long or short term use of the schools.

7.3.7 Fire and Police Protection

The proposed office and housing are all structures that were in use prior to the 2017 hurricanes which impacted the Virgin Islands. It is not anticipated that there would be any additional fire or police protection needed as the old structures would have also required protection.

Additional fire and police protection measures are as follows:

- There is direct access to the buildings from Lind Point Road & the road is being widened to have a consistent width to the base of the road.
- Building construction is out of non-combustible materials (concrete).
- Housing is using residential style fire protection in required areas.
- The Collections building will utilize a fire protection system.

7.3.8 Public Health

The proposed office and housing will be relocating people from other offices and housing around the island to a centralized location. There is not any anticipated increase of persons to impact the hospital or medical facilities on island.

7.4 SOCIAL IMPACTS

It is not anticipated that additional short or long term residents will be added through this project, rather they will be relocated to Lind Point Road housing and offices from other areas on the island. As Lind Point is already developed on the south side of the road with duplex housing and the north side of the road being infilled with the proposed project, there isn't any planned or anticipated growth in this area.

7.5 ECONOMIC IMPACTS

In 2017, two Category 5 hurricanes, devastated much of St. John, including Virgin Islands National Park. The storms caused extensive damage to park facilities and resources. Six housing structures and a variety of office structures that comprised the Resource Management Division of the park were destroyed or damaged beyond repair. Through the proposed project, we will be adding back these offices and housing structures, returning the housing to the island but relocating those in the office structures to one centralized spot. Due to this situation, there will not be any impact greater than what was previously on island.

7.6 IMPACTS ON HISTORICAL AND ARCHEOLOGICAL RESOURCES

As preparation for this project, the NPS Southeast Archeological Center undertook a field pedestrian survey and systematic subsurface testing of the Lind Point project area. No cultural resources, including historic ruins or archeological remains, were identified during the pedestrian survey or subsurface testing; therefore, no cultural resource impacts are expected to result from actions in this plan. Although there does not appear to be any archeological sites within the project area, site clearing and ground disturbing activities associated with this project would be monitored by an archeologist that meets Secretary of the

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Interior professional qualification standards to avoid or minimize impacts to previously undiscovered archeological resources.

7.7 RECREATIONAL USE

Virgin Island National Park utilizes a small portion of the site on Lind Point Road for gravel parking for a trail head that goes down to Salomon Bay and Honeymoon Beach. The other side of the trail goes to a Cruz Bay overlook and down to the Visitors Center. This project will be limiting the parking during construction, but will be keeping the trail open.

As part of the design of the project, a new paved parking lot will take the place of the old gravel parking. Along with this enhancement, there will be updated signage and a new trail head entrance for visitors to utilize.

7.8 WASTE DISPOSAL

The Virgin Islands Waste Management Authority (VIWMA) has specific guidelines and criteria for accepting construction debris. Construction debris shall be properly hauled and disposed at the Susannaberg Transfer Station to which it is then compacted and barged to St. Thomas where it is transported to the Bovoni Landfill on the southeastern end of St. Thomas for disposal.

Post construction waste disposal will be handled internally by National Park Service. The Park picks up waste at each residence and the Resource Management and Science Facility weekly to drop off at their internal collection center for VIWMA pick up.

Other wastes such as chemical residues, dredge spoils, oil, and hazardous materials are not anticipated at the Lind Point project based on the type of work and living occurring at the site.

7.9 ACCIDENTAL SPILLS

Wastes such as chemical residues, dredge spoils, oil, and hazardous materials are not anticipated at the Lind Point project based on the type of work and living occurring at the site. Should an unexpected leak, spill, or other release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR Part 110, 40 CFR Part 117, or 40 CFR Part 302 occur during a 24-hour period, contractor shall notify VIDPNR at (340) 774-3320 and the National Response Center (NRC) at (800) 424-8802 as soon as knowledge of the discharge occurs. Contractor shall also, within 7 calendar days of knowledge of the release, provide a description of the release, the circumstances leading to the release, and the date of the release.

7.10 POTENTIAL ADVERSE EFFECTS THAT ARE UNAVOIDABLE

Construction of the proposed developments in the Lind Point area would result in an adverse cumulative effect on vegetation in the area due to the direct loss of vegetation. However, this would result in minimal overall effect on the semi-deciduous woodland and thicket scrub on Lind Point because the vast majority of vegetation growing on the north side of the Lind Point ridgeline would not be affected. However it represents less than 0.05% of the total acreage of semi-deciduous woodland and less than 0.12% of the total acreage of thicket scrub in the park overall. Revegetation efforts would be expected to have a

beneficial effect, resulting in an increased abundance of native plants and a decrease in nonnative species in the project area

7.11 HURRICANE PREPAREDNESS

The proposed project site sits near the ridge of Lind Point, which greatly reduces the exposure to many of the threats identified. The site is elevated well above the food zone along the coast and is surrounded by established landscaping and existing structures. This elevation eliminates the direct threat of storm surge and impacts from sea level rise. Most significantly, the elevation of the proposed site creates the potential to magnify the impacts of a major wind event due to a natural phenomenon known as wind speed-up. As wind moves up an incline, such as the steep slopes around Lind Point, the speed increases, thus creating higher levels of pressure and suction on built structures.

As wind is omni-directional, its potential impacts must be considered on all sides of a building. After the 2017 storms, FEMA's Building Science Department sent a Mitigation Assessment Team (MAT) to observe damage around the islands and document the performance of various building strategies. Based on their observations and analysis, FEMA has proposed an increase in the base design wind speed used in the International Building Code for the Virgin Islands. The proposed increase modifies the current base wind speed by applying a mathematical factor to account for wind speed-up due to changes in topography. A revised wind speed map, developed by the FEMA MAT has been submitted to the International Code Council for review and potential inclusion in the 2021 building code.

The proposed design loadings for these buildings will generally be as required by the 2018 International Building Code (IBC 2018). The only exception to this is the increased design wind speed requirement from the NPS. The design wind speed from IBC 2018 is 175 mph for Category III and IV structures. The specified design wind speed from the NPS for this site is 220 mph. To meet the 220-mph wind load requirements, the proposed design incorporates cast-in-place concrete construction for all structural walls including all exterior and load bearing walls.

8.0 MITIGATION PLANS

Through the planning process of the Environmental Assessment, National Park Service identified specific mitigation measures for items such as view shed, cultural resources and vegetation. Such items are listed below:

View Shed

- The color of the exterior wall materials used on the structures would be selected to blend in with surrounding vegetation and to minimize visual obtrusiveness.
- Artificial exterior lighting would be used only where needed and only at times when needed. Warmer color lighting would be used, while blue-white light would be avoided. Controls that automatically dim or switch outdoor lights may be used to mitigate environmental impacts and conserve energy.
- All artificial exterior light sources associated with the structures would be shielded and directed downward to minimize visual obtrusiveness at night and light pollution of dark night skies.

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- New structural development would be designed to be low profile and blend into the environment as much as possible, taking advantage of the natural topography. The structures would be designed to be no more than one story in height, and no higher than any of the existing structures in the area.

Cultural Resources

- An archeologist meeting the Secretary of the Interior's standards would be on-site observing construction crews and their actions during ground disturbing activity. If artifacts, human remains, or landscape features such as old retaining walls or ruins are encountered, the superintendent of the park would be notified.

Vegetation

- Temporary barriers would be installed to protect natural surroundings (including trees, plants, and root zones). Any native vegetation to be preserved within the project area would be clearly identified by marking, fencing, or another appropriate technique prior to any construction activities.
- Prior to entry into the park, heavy equipment would be steam cleaned to prevent importation of nonnative plant species, and inspected to ensure that hydraulic fittings are tight, hydraulic hoses are in good condition and replaced if damaged, and there are no petroleum leaks.
- Removal of vegetation would be done in a manner that would not affect vegetation not proposed for removal.
- A contractor damage clause for impacts to trees / vegetation not within the project area would be part of the construction contract.
- Established vegetation on cut or fill slopes would be retained unless it impedes operations. Revegetation efforts would strive to reconstruct the natural spacing, abundance, and diversity of native plant species in the Lind Point area. Revegetation plantings would use native species from genetic stocks originating in the area. Monitoring of revegetated areas following construction would be conducted to ensure successful revegetation, maintaining plantings, and replacing plants that do not survive.

Soils

- A grading and erosion and sediment control plan would be prepared by the contractor to minimize erosion during construction.
- Ground/soil disturbance would be minimized to the greatest extent possible. All disturbed soil and fill slopes would be stabilized in an appropriate manner by the contractor.
- Topsoil would be salvaged from excavated areas for use in recovering source area or other project areas. Materials would be reused to the maximum extent possible.
- Excavated materials would be reused, rather than removed from the project area, for use in constructing berms or to level areas of impact.
- Piling of excavated soil alongside trees would be avoided.
- Any imported soils, fills, or aggregates would be checked prior to delivery to ensure they are free of deleterious materials. Sources of imported materials would be compiled by construction contractor and submitted for park review and approval prior to construction.
- If needed, weed-free clean fill and topsoil would be used.
- Erosion control measures, including approved siltation control devices (silt fences), would be used in construction areas to reduce erosion and capture eroding soils.

Water Quality

- A stormwater pollution prevention plan would be prepared by the construction contractor and implemented for construction activities to control surface runoff, reduce erosion, and prevent sedimentation from entering water bodies during construction. In addition, this plan would

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address hazardous materials storage, spill prevention, and response. The plan would be submitted for park review and approval prior to construction.

- Best management practices would be followed to stabilize the site, prevent erosion, and convey stormwater runoff to existing drainage systems, keeping contaminants and sediments on-site. Best management practices include silt fences and hay bales placed at the foot of slopes and at other locations to contain excavated material and to filter sediment from stormwater runoff, and temporary seeding of slopes for short-term restabilization.
- A comprehensive spill prevention / response plan would be developed that complies with federal and state regulations and addresses all aspects of spill prevention, notification, emergency spill response strategies for spills, reporting requirements, monitoring requirements, personnel responsibilities, response equipment type and location, and drills and training requirements. The spill prevention/ response plan would be submitted to the park for review / approval prior to commencement of construction activities.
- Temporary sediment control devices would be employed as needed, such as filter fabric fences, sediment traps, or check dams.
- Stockpiled soil would be covered throughout the duration of the project with semipermeable matting or plastic or another type of erosion control material.

Silt fencing or biodegradable sediment logs would be retained in disturbed areas until stabilization (by revegetation).

9.0 ALTERNATIVES TO PROPOSED ACTION

Per the NPS EA, this site selection and construction plan / environmental assessment presents two alternatives for replacement of buildings lost during Hurricane Maria. The two alternatives are alternative A, to continue current management and not replace the destroyed buildings (the no-action alternative); and alternative B, to construct replacement staff housing units and resource management administrative space at Lind Point (NPS proposed action / preferred alternative). Under both alternatives, the National Park Service would continue to follow existing agreements and service wide mandates, laws, and policies. Those mandates and policies are not included in this chapter (see NPS 2016). Please note that the alternatives only address development at Lind Point. As stated in chapter 1, the future of the damaged historic structures and other damaged residences in the rest of the park will be addressed in subsequent consultations and a future planning and NEPA process.

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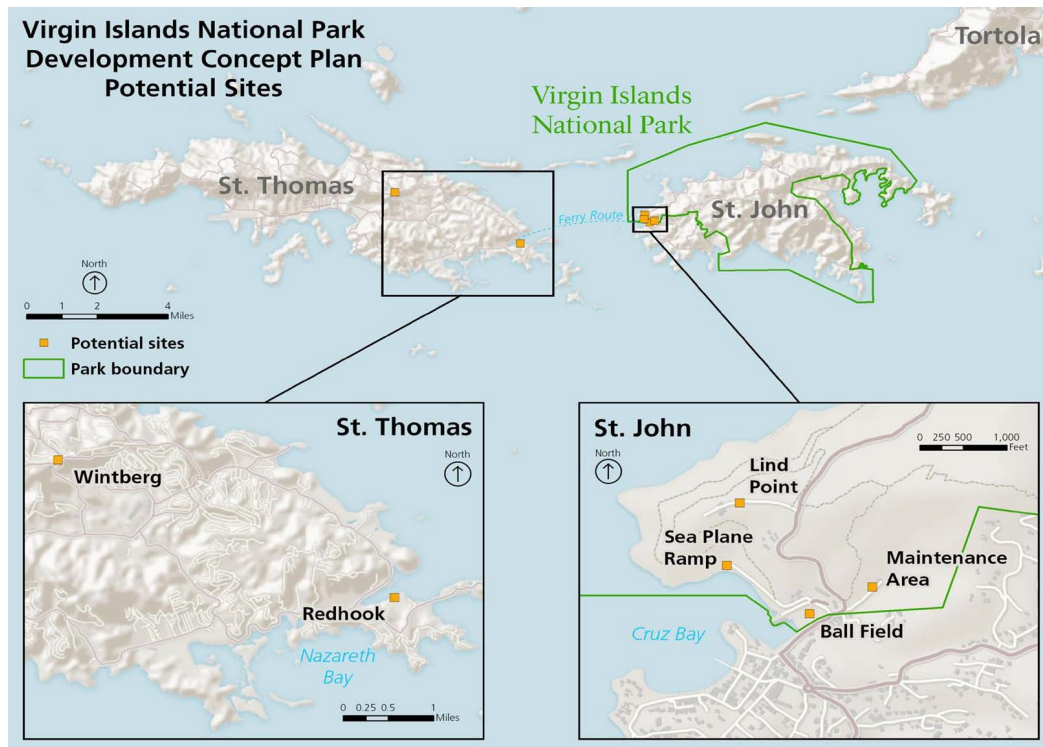


Figure 11 – Alternative Site Locations

Development of the Alternatives

The planning team relied on the park's previous planning documents for guidance in developing the alternatives, primarily the park's Foundation Document (NPS 2016). This plan was developed to be consistent with and protective of the park's purpose, significance, and Fundamental Resources and Values as identified in the Foundation Document. Fundamental Resources and Values are those features, systems, processes, experiences, stories, scenes, sounds, smells, or other attributes determined to warrant primary consideration during planning and management processes because they are essential to achieving the purpose of the park and maintaining its significance.

Site Selection Criteria

In addition to the purpose of the plan as outlined in chapter 1, several selection criteria were developed to aid in the selection of re-build sites. Initially, these criteria included established NPS management policies and the fiscal limitations of the funding to be used for storm recovery (criteria 1-3 below), but unique criteria were also developed to aid in decision-making (4-10). Ultimately, limitations in buildable areas under ownership of the park meant that no locations could meet every criteria, but the following criteria were useful in focusing decision-making on the overall purpose and need for the plan and development of the action alternative:

1) According to OMB Management Procedures Memorandum No. 2015-01, federal agencies should not increase the total square footage of office or warehouse space as part of a larger movement to find efficiencies in real properties owned by the federal government and "Freeze the Footprint." Any development included in this plan follows this government-wide mandate. Proposed storage facilities can

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meet but not exceed the square footage of buildings identified as storage that were lost during the 2017 hurricane season.

2) Hurricane relief project funds can only be used to replace the function of buildings that were severely damaged or destroyed and cannot be used to construct new facilities that are not directly related to these functions. Construction projects related to other park functions, including visitor contact stations, concessions, and maintenance activities, need to use a different funding source and are not considered as part of this planning effort. In addition, all effort must be made to ensure that cost efficiencies are maximized, as the funding provided for this effort is to be shared across all of the 2017 hurricane-impacted parks of the NPS' Southeast Region.

3) National Park Service Director's Order 77-2, Floodplain Management, directs the National Park Service to avoid construction of administrative or residential facilities within a 100-year base floodplain and the placement of collections and archival storage facilities within the 500-year floodplain. In the event that there are no alternative options, the construction can be approved following the development of a Floodplain Statement of Findings that spells out the mitigations that would be taken to reduce the hazard to natural resources of floodplains, and the hazards to human life and property.

Alternative A (Continue Current Management / No Action Alternative)

The no-action alternative is the continuation of current management actions and direction into the future. The no-action alternative, as required by NEPA, also serves as a baseline with which to compare the effects of action alternatives with those of the status quo. Under this alternative, the staff housing units and park administrative space lost during the 2017 hurricanes would not be replaced. Park operations and management would be required to adjust to the loss of infrastructure. Resource management staff would use existing space within the headquarters and maintenance facilities, possibly in shared office situations. Staff currently without housing would be required to continue to work remotely from other park units, and/or would eventually need to find suitable housing in the local community. With regard to the existing destroyed employee duplex unit and resource management offices at Lind Point, under alternative A, enough demolition would occur to make the area safe, but foundation ruins would be left in place. The Bally building under and adjacent to the resource management offices would continue to provide museum collection storage, until the water intrusion damage caused by the storm and subsequent wall corrosion can no longer be patched.

Alternative B (Proposed Action / NPS Preferred Alternative)

Under alternative B the National Park Service would construct resource management administrative space and staff housing units at Lind Point within a 2.8-acre area (122,000 square feet), situated at an elevation between 160 and 250 feet above sea level. Specifically, the National Park Service would reconstruct the destroyed duplex housing unit south of the Lind Point Road (approximately 1,300 square feet) within its existing footprint; construct three replacement housing units on the north side of the Lind Point Road (approximately 6,200 square feet total among the three structures); and construct a new resource management administrative facility on the north side of the Lind Point Road (approximately 6,000 total square feet, including appropriate space for museum collections storage, a lab, and a dive locker). The remains of the resource management offices and modular collections storage building would be demolished and removed, and the landscape around the former buildings would be replanted with appropriate native vegetation. Outlines of the proposed construction areas at Lind Point are shown in

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map 2. All new structures would be a maximum of one living story in height to minimize potential for future wind damage and limit their visibility above surrounding vegetation. They would be designed to complement both the surrounding landscape and the existing structures already present in the Lind Point development. All new construction would be built to modern hurricane code requirements.

10.0 RELATIONSHIP BETWEEN SHORT AND LONG TERM USE OF MAN'S ENVIRONMENT

The development of structures and artificial lighting would be partially visible along a ridgeline that is somewhat exposed to the north, west, and south. With the application of visual impact mitigation measures, this development would have a minimal adverse effect on the park's viewsheds and dark night skies in the westernmost part of the park. There also would be a minimal cumulative adverse impact when the effects of this project are added to the effects of prior park housing and office development in this area.

This project includes improvements to an existing road and parking with no expansion or extensions. There will be no additional secondary impacts as the current road and parking services housing on the south side of Lind Point Road

11.0 REFERENCES

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APPENDICES

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Appendix A ENVIRONMENTAL ASSESSMENT REPORT

Appendix A ENVIRONMENTAL ASSESSMENT REPORT

“Environmental Assessment for Lind Point Site Selection and Construction Plan” prepared by National Park Service dated 2018.

Appendix B **GEOTECHNICAL REPORT**

“Report On The Geotechnical Exploration Performed At The Site Of The Proposed Museum Collections Project, St. John, U.S. Virgin Islands” prepared by Jaca and Sierra Testing Laboratories and Geotechnical Engineers dated November 20, 2019

Appendix C **COMPREHENSIVE STORMWATER PREVENTION AND POLLUTION PLAN (C-SWPPP)**

“Comprehensive Stormwater Pollution Prevention Plan (C-SWPPP) For Construction Activities:” prepared by Stantec Consulting Services Inc. dated January 10, 2020

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Appendix D VISHPO Approval

Appendix D VISHPO APPROVAL

Virgin Islands SHPO approval letter received November 12, 2019.

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Appendix E OTHER REQUIRED FORMS

Appendix E OTHER REQUIRED FORMS

This section contains the following forms:

1. L&WD-2 - Permit Application
2. L&WD-3 - Zoning Requirements Table
3. L&WD-4 - Major Project Summary Data
4. L&WD-8 - Floodplain Determination Application
5. NPS Delegation of Authority Form

Note the following forms were **not included** since the applicant (National Park Service) is a Federal Entity:

1. Approved Road and Driveway Permit (NPS owns Lind Point Road)
2. L&WD-5 - Proof of Legal Interest
3. L&WD-6 - Application for Tax Filing and Payment
4. L&WD-7 - Corporation/Association Application
5. Tax Clearance Letter
6. Property Tax Clearance Letter
7. Certificate of Good Standing
8. Corporate Resolution
9. Legal Ownership/Lease of Property (e.g. deed) Document

Appendix F TEAM QUALIFICATIONS